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347 STAINLESS STEEL, UNS S34700

Strip, Coil, Foil, Wire, AMS 5512

Applications

Collector rings, airplane exhaust stacks, annealing box covers, jet engine parts, expansion joints, tubing, fasteners, flexible metal hose and bellows

Description

Type 347 is a stabilized austenitic stainless steel similar to type 304 with an addition of Columbium and Tantalum. The columbium serves to produce a stabilized type of stainless steel which is immune to chromium carbide precipitation. This type of grades are thus recommended for parts fabricated by welding which cannot be subsequently annealed or for parts which must operate in service between 800 – 1600 °F.

Chemistry Typical

Carbon: 0.08 max
Manganese: 2.00 max
Silicon: 0.75 max
Chromium: 17.00-19.00
Nickel: 9.00-12.00
Molybdenum: 0.75 max
Columbium + Tantalum: 10 x (Carbon + Nitrogen) min-1.00 max
Phosphorus: 0.040 max
Sulfur: 0.030 max
Copper: 0.75 max
Iron: Balance

Physical Properties

Density: 0.288 lbs/in³ 7.97 g/cm³

Electrical Resistivity: microhm-in (microhm-cm): 68 °F (20 °C): 28.7 (73)

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Specific Heat: BTU/lb/°F (kJ/kg•K):
32 - 212 °F (0 - 100 °C): 0.12 (0.50)

Thermal Conductivity: BTU/hr/ft²/ft/°F (W/m•K):
At 212 °F (100 °C): 9.3 (16.0)
At 932 °F (500 °C): 12.8 (22.0)

Mean Coefficient of Thermal Expansion: in/in/°F (µm/m•K)
32 - 212 °F (0 - 100 °C): 9.3×10^{-6} (16.6)
32 - 1000 °F (0 - 538 °C): 10.5×10^{-6} (18.9)
32 - 1500 °F (0 - 873 °C): 11.4×10^{-6} (20.5)

Modulus of Elasticity: ksi (MPa)
 28×10^3 (193×10^3) in tension
 11.2×10^3 (78×10^3) in torsion

Magnetic Permeability: H = 200 Oersteds: Annealed < 1.02 max

Melting Range: 2500 - 2550 °F (1371 - 1400 °C)

Forms

Coil – Strip, Foil, Ribbon
Wire – Profile, Round, Flat, Square

Mechanical Properties at Room Temperature

Properties: Annealed

Ultimate Tensile Strength: 75 KSI min (515 MPa min)
Yield Strength (0.2% Offset): 30 KSI min (205 MPa min)
Elongation: 40% min
Hardness: RB 92 max

Properties: Tempered

Type 347 can be cold rolled various tempers. Contact Ulbrich Technical Services for additional information.

Additional Properties

Corrosion Resistance

Refer to NACE (National Association of Corrosion Engineers) for recommendations.

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Finishes

1 – Hot rolled annealed and descaled. It is available in strip, foil and ribbon. It is used for applications where a smooth decorative finish is not required.

2D – Dull finish produced by cold rolling, annealing and descaling. Used for deep drawn parts and those parts that need to retain lubricants in the forming process.

2B – Smooth finish produced by cold rolling, annealing and descaling. A light cold rolling pass is added after anneal with polished rolls giving it a brighter finish than 2D.

#BA – Bright annealed cold rolled and bright annealed

#CBA – Course bright annealed cold rolled matte finish and bright anneal

#2 – Cold Rolled

2BA – Smooth finish produced by cold rolling and bright annealing. A light pass using highly polished rolls produces a glossy finish. A 2BA finish may be used for lightly formed applications where a glossy finish is desired in the formed part.

Polished – Various grit finish for specific polish finished requirements.

** Not all finishes are available for all alloys – Contact Ulbrich Sales for more information.*

Wire Finishes

XC – Extra clean bright annealed or bright annealed and cold rolled

Grease – Ultra-bright finish (for decorative applications)

Soap – Soap is not removed from tempered wire to act as a lubricant.

** Contact Ulbrich Wire for custom wire finishes.*

Cold Forming

Type 347 can be readily formed and drawn. Like most other austenitic stainless steels, type 347 work hardens and may require annealing after severe forming.

Heat Treatment

Type 347 is non hardenable by heat treatment. It can only be hardened by cold working.

Welding

Type 347 is weldable by common fusion and resistance methods. Use type 347 or 348 filler rod or electrodes.

For best results refer to: SSINA's "Welding of Stainless Steels and Other Joining Methods".

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